<u>Amendments to the Specification</u>:

Please replace paragraph [0005] as follows:

[0005] Techniques for modelling fractured porous media are described in French Patents ~~2,575,947~~<u>2,757,947</u> and 2,757,957 filed by the assignee. The technique of the first patent relates to determination of the equivalent fracture permeability of a fracture network in an underground multilayer medium from a known representation of the network, allowing systematic connection of fractured reservoir characterization models to double-porosity simulators in order to obtain more realistic modelling of a fractured underground geologic structure. The technique of the second patent relates to simplified modelling of a porous heterogeneous geologic medium (such as a reservoir crossed through by an irregular network of fractures for example) in the form of a transposed or equivalent medium so that the transposed medium is equivalent to the original medium, according to a determined type of physical transfer function (known for the transposed medium).

Please replace paragraph [0010] as follows:

[0010] For any elementary volume of the reservoir, the pressure of the oil contained in this volume is governed by the following equation, if gravity is not

$$\cancel{\phi C_T \frac{\partial P}{\partial t} = div\left(\frac{K}{\mu}\nabla P\right) + Q \qquad (1)}$$

taken into account :

where:

$$\phi C_T \frac{\partial P}{\partial t} = div(\frac{K}{\mu} \nabla P) + Q \qquad (1)$$

ϕ : represents the pore volume,

C_T, the total compressibility (fluid + rock),

K, the permeability of the rock,

μ, the viscosity of the fluid,

Q, the incoming flow, which is zero everywhere except in places where the well communicates with the reservoir, and

P, the unknown pressure.

Please replace paragraph [0020] as follows:

DETAILED DESCRIPTION OF THE INVENTION

1) Fracture network discretization

[0020] The method comprises meshing the multilayer fractured reservoir modelled for example by means of the fractured reservoir modelling technique described notably in the aforementioned French Patent ~~2,575,947~~2,757,947 assuming that the fractures are substantially perpendicular to the layer boundaries.

Please replace paragraph [0026] as follows:

a) Block geometry

[0026] In order to determine the geometry of the blocks in a given layer, a two-dimensional problem has to solved which finds, for each fracture mesh, the points that are closer to this mesh than to another one . This problem is solved by using for

example, but preferably, the geometric method described in the other aforementioned French Patent ~~2,757,947~~2,757,945, which allows, by discretizing the fractured layer into a set of pixels and by applying an image processing algorithm, to determine the distance from each pixel to the closest fracture. During the initialization phase of this algorithm, value 0 (zero distance) is assigned to the pixels belonging to a fracture and a high value is assigned to the others. Furthermore, if the number of the fracture mesh to which each fracture pixel belongs is given in this phase, the same algorithm finally allows to determine, for each pixel :

- the distance from this pixel to the closest fracture mesh,
- the number of the closest fracture mesh.

Please replace paragraph [0030] as follows:

b) Matrix-fracture transmissivity

[0030] On the assumption of a pseudosteady state where the exchange flow is considered to be proportional to the difference in the pressures of each one of them, the following relation exists:

$$F_{mf} = \frac{T_{mf}}{\mu}(P_m - P_f) \quad \overset{2}{\cancel{(1)}}$$

where :

F_{mf} is the matrix-fracture flow,

T_{mf}, the matrix-fracture transmissivity,

μ, the viscosity,

P_m, the pressure of the matrix block, and

P_f, the pressure of the associated fracture mesh.

Please replace paragraph [0032] thru [0034 as follows:

[0032] For this calculation, it is assumed that, in the matrix block, the pressure varies linearly as a function of the distance from the point considered to the fracture mesh associated with the block. The transmissivity is defined as follows :

$$T_{mf} = \frac{2l \cdot H \cdot K}{D} \qquad \overset{3}{\cancel{(2)}}$$

where :

l is the length of the fractures in the fracture mesh,

H, the height of the layer (and of the matrix block),

K, the permeability of the matrix, and

D, the distance from the fractures for which the pressure is the mean pressure of the block.

[0033] l, H and K are known (factor 2 comes from the fact that the fracture has two faces). Calculation of D is made from the information provided by the image processing algorithm concerning the distances from the pixels to the closest fractures. In fact, according to the hypothesis of linear variation of the pressure as a function of the distance to the fracture, the relationship is :

$$D = \frac{1}{S} \cdot \int_S d(s)\, ds \qquad \overset{4}{\cancel{(3)}}$$

where S is, in 2D, the surface area of the matrix block and d(s) is the function giving the distances between the points of the matrix block and the associated fracture mesh.

[0034] In terms of pixels, the relationship is :

$$D = \frac{1}{N} \sum_{N} d_n \qquad \overset{5}{(\cancel{4})}$$

where N is the number of pixels of the matrix block and d_n the distance from pixel n to the fracture mesh.

Please replace paragraph [0040] as follows:

[0040] Passage from the time n (where all the pressure values are known) to the time n+1 is achieved by solving, in all the meshes and blocks of the reservoir, the following equation which corresponds to relation 1 once discretized :

$$\phi_i . C_T . \frac{P_i^{n+1} - P_i^n}{t^{n+1} - t^n} + \sum_j \frac{T_{ij}}{\mu} . (P_i^{n+1} - P_j^{n+1}) = Q_i \qquad \overset{6}{(\cancel{5})}$$

where :

i, the number of the mesh or of the block,

j, the number of the mesh or of the block next to i,

P^n, the pressure at the time n,

t^n, the time at the time n,

Q_i, the flow entering i, and

T_{ij}, the connection transmissivity between i and j.

Please replace paragraph [0044] as follows:

[0044] In fact, for a matrix block, equation (7) is expressed as follows :

$$\phi_m \cdot C_{Tm} \frac{P_m^{n+1} - P_m^n}{t^{n+1} - t^n} + \frac{T_{mf}}{\mu} (P_m^{n+1} - P_f^{n+1}) = 0 \qquad 7 \ \cancel{(6)}$$

subscripts m and f denoting the matrix and the fracture respectively, and C_{Tm} being the total compressibility of the matrix.